In the American Tropics, the American S. S. *Wacosta* ran into a cyclone of considerable intensity on the 1st and 2d, while at some distance southwest of Manzanillo, Mexico. The vessel's highest wind velocity was of force 10 from the northeast, lowest barometer, 1,004.7 millibars (29.67 inches), in 15°18′ N., 107°18′ W., at 10 p. m. of the 1st. Northeast to southeast gales of decreasing intensity continued until about 6. a. m. of the 2d. The cyclone, apparently blocked from northward movement by high pressure, took an unusual southwesterly course and appears to have persisted until the 3d, although no strong winds were reported after the 2d.

Tehuantepecers.—In the Gulf of Tehuantepec, norther-type gales of force 7 were reported on the 4th and 5th, and of force 10 on the 15th, 16th, and 17th.

Fog.—Isolated occurrences of fog were observed on the 3d and 4th about midway along the San Francisco-Honolulu route; on the 8th and 9th south of the Aleutian Islands; and on the 9th to 11th near 45° N., 140° to 150° W. It was reported on 7 days off or near the California coast, and on 1 day off the middle coast of Lower California.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Typhoon, November 2–10, 1940.—The weather maps of November 2 had indications of a disturbance somewhere southeast of Guam. The fall in pressure shown on the afternoon map indicated clearly that this disturbance was of typhoon strength and the extra evening observations supplied by Mr. Lewis Stroup, stationed at the Commercial Pacific Cable office in Guam, showed that the storm was approaching the locality of the island. On November 3, the center passed close to and south of the island, moving in a northwesterly direction. It continued along a course, either northwest or west-northwest, to the regions near longitude 135° E., where it inclined to the north. November 6 and the two following days, the center recurved to the northeast. November 9, it was located very close to and southeast of the Bonins. A few ships' reports of November 10, showed that the center was far to the east-northeast of the Bonins (Ogasawaras), moving east-northeast or northeast toward the date line.

The typhoon center passed very close to and south of the office of the Commercial Pacific Cable Company in Guam. It is possible that the center passed over the island itself, but no reports that any of the villages on the island experienced the calm center have reached this office up to the time of writing this article. The minimum pressure occurred at 1.45 p. m. Guam time, and was 716.69 mm. (955.5 mb.), gravity correction applied. The winds were east at the time, with a velocity estimated over 125 m. p. h. For about 10 or 15 minutes, about the time of the minimum, according to Mr. Stroup, there was a lull in the wind, decreasing to about 80 m. p. h. (estimated). About 20 minutes before the minimum, the barometer was pumping, which continued until after the barometer reached its minimum. Mr. Stroup supplied the Observatory with many observations as the storm progressed and the series is given here, but in a brief form:

November 2, at 8 p. m., Guam time, pressure 750.60 mm. (1000.7 mb.) winds NNE, force 6; 10 p. m., 750.18 mm. N winds, 30 m. p. h.; midnight, 748.68 mm., NNW winds, 30 m. p. h.; November 3, 4 a. m., 745.10 mm., N winds, 48 m. p. h. squally; 5 a. m., 743.90 mm. N winds, 42 m. p. h.; 6 a. m., 743.80 mm., N winds, 42 m. p. h.; 7 a. m., 742.70 mm., NNE winds, 50 m. p. h.; 8 a. m., 741.83 mm., NNE winds 60 m. p. h., raining hard last two hours; 9 a. m., 740.68 mm. (987.5 mb.), NNE winds, 70 m. p. h.; 10 a. m., 737.28 mm. (983.0 mb.), NNE winds, 80 m. p. h.; 11 a. m. 731.65 mm. (975.5 mb.), NNE winds, 108 m. p. h.; anemometer ceased recording but cups can be seen revolving; noon, 724.62 mm. (966.1 mb.), NNE winds estimated more than 125 m. p. h.; 12.15 p. m., winds definitely NE; approximately 1.15 p. m. wind has changed to E, anemometer mast is down; approximately 1.25 p. m. 716.86 mm. (955.8 mb.) wind shifting ENE to E, terrific, barometer pumping; 1.45 p. m., minimum pressure 716.69 mm. (955.5 mb.) (28.22 inches), wind E terrific, then notably diminishing and becoming gusty; 2 p. m., 717.93 mm. (957.1 mb.), E winds, hurricane force; 3 p. m., 720.04 mm. (960.0 mb.) E to ESE, violent. After 3 p. m. no more extra observations were requested. The anemometer cups, it may be added, had been in use on station since 1918.

The loss of life was very small, considering the duration of these strong winds. From private sources, the writer learned that about five persons were missing after the storm, and it is supposed that they were drowned. Besides, two or three persons were killed when trees crashed down upon their houses. The property loss was enormous. Very few buildings were left undamaged. The greatest damage occurred with the east quadrant winds during the afternoon, after the center had passed.

On November 9, when the center was not very far from the Bonins, pressure at that station (the morning observation) was 729.5 mm. (972.6 mb.) with north-northwest winds force 5. At this time the storm center was moving east-northeast or northeast after recurvature.

The upper winds over Guam before the typhoon arrived were from the east quadrant. October 29 and following days, gradually backing, day after day, to the northeast and finally, on November 2, morning ascent, becoming north and north-northeast. Velocities were seldom over 30 k. p. h. before November 1, and never over 40 k. p. h. until after November 1, morning ascent. On the morning of November 2, the upper winds, as reported from the Navy station, were as follows—200 m., direction 10°, velocity 47 k. p. h.; 500 m., 10°, 49 k. p. h.; 1,000 m., 20°, 50 k. p. h., 1,500 m., 20°, 42 k. p. h. 2,000 m., 30°, 6 k. p. h. Balloon obscured. (Direction 360°, N—90° E, etc.) Very strong southeast quadrant winds were reported November 4 and 5 after the storm center had passed.

Over the Philippines, at Zamboanga, there was a shift to the southwest quadrant, the velocities never reaching 30 k. p. h., October 30 and 31. It seems as though there was a tendency to change to the southwest because of the distant forces which caused the typhoon to form. November 2 and the following days, Zamboanga again had east quadrant winds aloft, but changing to the southwest and northwest quadrants just when the typhoon center was recurving (November 5 and 6). Northeast and east quadrant winds prevailed over the other Philippine stations. None of the other reports at hand seem to have any interesting aspects to be mentioned. However the data from Netherlands East Indies and the Straits Settlements (which cannot be received by radio at the Observatory) should show more points of interest.

As this is written, November 20, it must be remarked that since late in September 1940, there has not been any typhoon close to the Philippines, excluding a small,

active center which formed over the China Sea and moved into the Continent during October. This is extraordinary for this time of the year. It is having its effect in a shortage of rain over various provinces of the Philippines, and the rice crop is not as plentiful as it might be. The typhoon activity continues to take place far to the east of the Archipelago, continuing the October 1940 conditions.

ADDITIONAL REPORT

Depression, November 25–30, 1940.—Pressure at Yap was rising and winds were veering toward the southeast during the afternoon of November 25, indicating the presence of a disturbance east of Mindanao. November 26, there was a depression about 120 miles east-northeast of Catanduanes Island, moving northwesterly. The fall in pressure over Samar and southern Luzon gave the impression that the storm was intensifying, but evening observations showed that this process did not continue. The center moved toward the eastern part of the Balintang Channel, where it recurved to the northeast. Apparently the depression was of minor importance, and if it were violent, it was such only over a very small area.

About four or five days previous to November 25, the east quadrant winds over Guam increased to values as high as 60 k. p. h. at a few levels, and in general showing a current flowing about 40 to 50 k. p. h. Over the Philippines, winds from the northeast and east quadrants existed until November 25, but the velocities were never over 30 k. p. h. A weak northeast quadrant current was flowing over Manila, Cebu, and Zamboanga November 25, and backing to the north and northwest during the afternoon. November 26 and 27, weak winds from the west and southwest quadrants were reported over Zamboanga and Cebu. Above 3,000 meters over Zamboanga there was an easterly current veering to the southeast, November 27. Manila's upper winds backed from east to north-northwest during these days. On November 28, all directions were from the northeast and east quadrants. The velocities were never over 45 k. p. h. during these days. When the center was east of northern Luzon and about to recurve, Aparri reported northeast and north winds, with velocities about 50 k. p. h. at various levels. It seems from available data that the air was attracted toward the center, an impression that might be changed when ascension reports from southern regions are received.

FLOOD LOSSES AND SAVINGS FOR THE YEAR 1939

BENNETT SWENSON

[Weather Bureau, Washington, January 1941]

Estimated flood losses for the year 1939 and savings reported as the result of warnings are tabulated below. The total loss has been estimated at $13,833,806, with a saving of more than $2,000,000. A total of 83 lives were lost.

The year 1939, except for one or two instances, was free from severe floods. The most severe single flood probably was the flash flood in eastern Kentucky on July 4 and 5. In this flood, which occurred in the mountain streams in the upper Licking and Kentucky River basins, 78 lives were lost, and an estimated monetary loss of more than $1,700,000 was suffered in four counties.

Estimated flood losses and savings for 1939

River and drainage	Tangible property	Matured crops	Prospective crops	Livestock and other movable farm property	Suspension of business	Total	Lives lost	Reported savings as the result of warnings
ST. LAWRENCE								
Grand River in Michigan					$11,100	$11,100		
ATLANTIC SLOPE								
Tioughnioga and Chenango Rivers	$125	$1,000			700	1,825		$1,700
Chemung River	4,000	600			5,000	9,600	2	15,000
Susquehanna River	43,350	100		$500	900	44,850		31,200
Roanoke River	340	25,000	$37,500	3,000	37,740	103,580		77,200
Tar River	100	18,000	22,500	3,000	4,740	48,340		15,500
Neuse River	2,500	18,000	30,500	3,200	14,740	68,940		22,000
Cape Fear River	500	22,000	23,500	3,200	5,740	54,940		35,500
Peedee River	16,500		55,000	2,000	8,000	81,500		36,000
Saluda River	3,680	400				4,080		11,500
Broad River, in South Carolina		50	150			200		1,300
Congaree River				100	510	610		2,150
Catawba-Wateree River	300		10,000	1,000	3,800	15,100		31,700
Santee River	3,500			3,000	6,000	12,500		7,500
Savannah River	500			750	10,000	11,250		100,000
Ogeechee River				100	2,000	2,100		5,000
Altamaha River	9,500		12,750	5,800	23,150	51,200		112,575
EAST GULF OF MEXICO								
Flint River	(1)				50	50		1,000
Apalachicola River	2,000	1,000		1,500	6,760	11,260		9,000
Choctawhatchee River	24,050	510,700	250	700	500	536,200		4,100
Conecuh River	31,950	250,000	50,000	270	3,300	335,520		1,850
Alabama River	631,000	1,108,000	420,000	49,000	6,500	2,214,500		71,000
Black Warrior-Tombigbee River						[2]3,545,600		15,200
Pearl River	9,770	1,000	7,900	5,450	12,650	36,770	1	47,500
MISSISSIPPI SYSTEM								
Upper Mississippi Basin								
Chippewa River	1,650					1,650		
Wisconsin River	1,375		300		3,400	5,075		67,500
Rock River					200	200		
Iowa River	2,600	200				2,800		
Des Moines River	9,350	790	3,940	100	2,220	16,400		15,400
Salt River			71,000		5,500	76,500		
Illinois River	2,100					2,100		
Meramec River	15,150	200	40,600	75	6,500	62,525		32,600
Mississippi River above Cairo, Ill	43,275	500	14,875	200	1,650	60,500		45,700
Missouri Basin								
Big Muddy River	5,000					5,000		
Mills River	150,000			50,000		200,000		
Solomon River	42,750	3,000	31,200	4,000	2,000	82,950		17,600
Big Blue River	12,000					12,000		
Grand River in Missouri	55,000	1,200		900		57,100		20,000
Missouri River	36,250	31,525	159,850	7,500	17,200	252,325		127,100
Ohio Basin								
Allegheny River					500	500		20,000
Monongahela River	23,000			10,000	3,000	36,000		20,000
Little Kanawha River	21,800			1,000		22,800		
Olentangy River			10,000			10,000		
Scioto River			52,000			52,000		
Licking River						[2]1,365,000	27	
Kentucky River						[2]350,000	51	
Green River	13,800	1,000	7,700		32,000	54,500		93,000
White River in Indiana	48,075		150,300	1,000	43,550	242,925		137,000
Wabash River	173,650	3,500	341,376	11,800	41,800	572,126	2	292,700
Cumberland River						[2]638,640		168,100
Ohio River	105,700	2,500	159,100	5,600	155,400	428,300		468,000
White-Arkansas Basin								
Black River	1,500		500			2,000		
White River	50		6,600		2,600	9,250		
Cowskin and Big Slough Creeks in Kansas			45,000			45,000		
Ninnescah River			5,000			5,000		
North Canadian River	14,800	7,500	22,950			45,250		5,000
South Canadian River	28,000	4,100	4,000			36,100		
Poteau River	5,000	3,000	2,800		1,500	12,300		
Petit Jean River	350			100		450		500
Arkansas River	2,000		20,000		2,000	24,000		5,000
Red Basin								
Sulphur River								1,100
Ouachita River	3,000		2,000	1,900	15,300	22,200		104,000

[1] Figures not available. [2] Furnished by U. S. Engineer Office.